

2.1 Plant Cells, Tissues, and Organs

Consider an organism that reproduces sexually. It starts out as a *single cell* that was formed from the combination of a male gamete (e.g., sperm cell) and a female gamete (e.g., egg cell). That first cell ("the zygote") multiplies through the process of mitosis & cytokinesis, producing identical daughter cells, eventually forming an *embryo*. At some point, the cells of the embryo need to become different types of cells...this stage of development is called _____.

- _____ is the process by which cells develop specific functions (and structures). This happens because some genes are turned on, and others are turned off.

Specialized Cells and Tissues in Plants

- _____ cells are:
- undifferentiated (unspecialized) cells & give rise to all other types of specialized cells
 - constantly dividing
 - found at the tips of roots and branches, as well as throughout stems and roots

- Plant cells are organized into plant _____.

Complete the table with the 3 main types of plants tissues & their main functions:

Plant Tissue:	Functions:

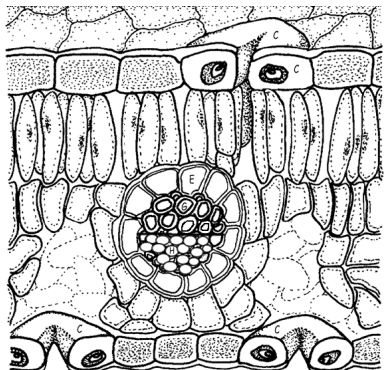
Tissues Working Together: Plant Organs

- Different kinds of plant tissues combine to make up plant _____ (such as leaves, stems, and roots).

Leaves:

- The main function of leaves is to perform _____.

- Label the following diagram of a leaf cross-section:



-Complete the following chart with the main function of these leaf structures:

Structure:	Main function:
cuticle	
upper & lower epidermal cells	
palisade mesophyll cells	
spongy mesophyll cells	
vascular bundles (xylem & phloem)	
stomata	
guard cells	

-Chlorophyll is a green pigment that allows plant cells to trap light energy from the Sun for photosynthesis. It is found in chloroplasts in little sacs called _____, They are arranged in stacks called _____.

Stems:

-What are the 2 main functions of the stem?

-Dead _____ cells contain lignin, making them strong, and helping them to keep the plant stem upright.

Roots:

-What are the 2 main functions of the roots?

-There are two main types of root systems:

- _____ (with one main root that grows larger and thicker than the rest)
- _____ roots (which spread out horizontally near the surface of the soil)

Flowers:

-Not all plants produce flowers. The function of flowers is _____.

-They produce male gametes (pollen grains) and female gametes (eggs) for sexual reproduction. Pollination is sometimes aided by birds, bats, or insects.

Plants Under Attack

-Plant _____ are like tumours in animals, produced by the abnormal growth of groups of cells. They are produced in response to attacks by insects, fungi, bacteria, and viruses (such as the tobacco mosaic virus, TMV).